

WELDING PROCEDURE SPECIFICATION

WPS - 2007-23-P REV. NO.: 0 DATE: 8/15/2006 **APPLICABILITY**

WELDING PROCESS: GTAW- and GTAW ASME: X AWS: X OTHER:

SUPPORTING PQR: PA-46-1 Z-WS7A-1

JOINT: This WPS shall be used in conjunction with the General Welding Standards (GWS) and Welding Fabrication Procedure (WFP) sections and criteria for joint details, repairs, NDE, inspection etc.

Weld Joint Type: Butt/Groove/Fillet Class: Full or Partial Penetration See GWS 1-06 and WFP's for joint details Preparation: Thermal/Mechanical With or without 0-1/16" **Root Opening:** Backing: Metal or Gas Use on double sided joints **Backing Mat.: Backgrind root:** Gouge, Chip, Grind **GTAW Flux:** N/A **Bkgrd Method: Backing Retainer:** N/A **FILLER METALS:** ER4043 ER4043 Class: and **Size:** 3/32 1/4 A No: N/A SFA Class: 5.10 and 5.10 F No: 23 and 23 3/16 Insert: N/A Insert Desc.: N/A Weld Metal Thickness Ranges: Flux: Type: N/A Size: N/A 0.125 thru .187 **AWS Root Pass: AWS Balance:** 1.00 **Filler Metal Note:** 0.126 thru **ASME Root Pass:** .0625 thru 0.187 .0625 thru **ASME Balance:** 1.00 **BASE MATERIAL** P No. 23 Gr No. All to: P No. 23 Gr No. All **Spec.** B-209 Al- Plate & sheet Grade: All to: Spec. B-209 Al- Plate & sheet Grade: All **AWS:** 24 **ASME**: 0.25 **Qualified Pipe Dia. Range: ≥ Qualified Thickness Range: AWS:** 0.125 1.000 **ASME:** 0.063 1.000 thru thru **QUALIFIED POSITIONS:** AWS: 1G, 2G, 3G ASME: All Vert. Prog.: Uphill Preheat Min. Temp.: 70°F **GAS: Shielding:** Helium or Gas Composition: 100 / **Interpass Max. Temp.:** 150°F % % 150°F **Preheat Maintenance:** Gas Flow Rate cfh: 15 35 to to PWHT: Time @ °F Temp. 0 **Backing Gas/Comp:** 100 % Argon Temp. Range: **Backing Gas Flow cfh:** to 0 $0 \, ^{\circ} \mathbf{F}$ N/A Trailing Gas/Comp: 0 % to

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Signatures on file at ENG

APPROVAL:

WPS NO: 2007-23-P

WELDING CHARACTERISTICS:

Current: DCEN and DCEN Tungsten Type: EWTh-2 Transfer Mode: N/A

Ranges: Amps 75 to 320 Tungsten Dia.: 3/32 Pulsing Cycle: 0 to 0

Volts 15 to 21 Background Current: 0

Fuel Gas: N/A Flame: N/A Braze temp. °F N/A to N/A

WELDING TECHNIQUE: For fabrication specific requirements sucg as fittup, cleaning, grinding, PWHT

and inspection criteria refer to Volume 2, Welding Fabrication Procedures

Technique: Manual Cleaning Method: Wire Brush

Single Pass or Multi Pass: M Stringer or Weave bead (S/W): S Oscillation: N/A

GMAW Gun Angle °: 0 to 0 Forehand or Backhand for GMAW (F/B): N/A

No Pass S>1/2": True GMAW/FCAW Tube to work distance: N/A

Maximum K/J Heat Input: N/A Travel speed: variable Gas Cup Size: # 5

PROCEDURE QUALIFIED FOR:

Charpy "V" Notch: N/A Nil-Ductil Transition Temperature: N/A Dynamic Tear: N/A

Comments: Developed as result of S & W review of 2010-23

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	GTAW-	ER4043	3/32	75 to 320	15 to	18 to	0 to 0	
2	GTAW	ER4043	3/16	to	to	to		
3 4	GTAW	ER4043	1/4	0 to 0	0 to 0	to		
5	GTAW	ER4043		0 to 0	to	to		
6								

REM. * Weld layers are representative only - actual number of passes and layer sequence may vary due to variations in joint design, thickness and fitup.

Use of LANL Welding Procedures and Welder Qualifications for non-LANL work shall be at the sole risk and responsibility of the Subcontractor, and the Subcontractor shall indemnify and save LANL and the Government harmless from any and all claims, demands, actions or causes of action, and for any expense or loss by reason of Subcontractor's and their employees posession and use of LANL procedures and qualifications.

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